II. Listing of Claims

1. (Original):   A method for protecting against rollover in a motor vehicle comprising the steps of:

providing an array of linear acceleration sensors at predetermined locations relative to the center of gravity of the vehicle;

providing a control module having a model of the vehicle dynamics and a model of the array of sensors;

detecting an acceleration for each sensor in the array of sensors;

estimating a roll angle of the vehicle based on the detected accelerations, the model of the vehicle dynamics and the model of the sensors;

generating a control signal based on the roll angle; and

reducing the roll moment of the vehicle based on the control signal.

2. (Original):   The method of claim 1, further comprising the step of estimating a roll rate based on the detected accelerations, the model of the vehicle dynamics and the model of the sensors.

3. (Original):   The method of claim 2, wherein the control signal is based on both the roll angle and the roll rate.

4. (Original):   The method of claim 2, further comprising the step of estimating a roll acceleration of the vehicle based on the detected accelerations, the model of the vehicle dynamics and the model of the sensors.

-3-

5. (Original): The method of claim 4, wherein the control signal is based on the roll angle, the roll rate and the roll acceleration.

6. (Original): The method of claim 1, wherein the step of estimating a roll angle includes estimating a state vector representing the dynamic condition of the vehicle based on the detected accelerations, the model of the vehicle dynamics and the model of the sensors.

7. (Original): The method of claim 6, wherein the state vector includes a roll angle, a roll rate, a yaw rate and a lateral velocity of the vehicle.

8. (Original): The method of claim 6, wherein the control signal is based on the estimated state vector.

9. (Original): The method of claim 1, wherein each acceleration sensor detects a linear acceleration along a sensor axis positioned relative to the vehicle's coordinate system, the coordinate system including a longitudinal axis, a lateral axis and a vertical axis of the vehicle.

10. (Original): The method of claim 9, wherein the sensor axis of at least one acceleration sensor is not parallel with any of the longitudinal, lateral and vertical axes.

-4-

11. (Original):   The method of claim 9, wherein the location of at least one acceleration sensor is not aligned with any of the longitudinal, lateral and vertical axes.

12. (Original):   The method of claim 9, further comprising the step of transforming the detected accelerations from a sensor coordinate system to a body coordinate system.

13. (Original):   The method of claim 1, wherein the step of reducing the roll moment includes activating an actuator, the actuator being one or more of a brake control system, an engine control unit and an active steering system.

14. (Original):   The method of claim 1, further comprising the step of providing an angular rate sensor.

15. (Currently Amended):   A method for protecting against rollover in a motor vehicle, the vehicle defining a longitudinal axis, a lateral axis, and a vertical axis, each axis passing through the center of gravity of the vehicle, the method comprising the steps of:

providing an acceleration sensor positioned along the lateral axis of the vehicle, the sensor spaced a distance from the center of gravity;

detecting an acceleration on the vehicle with the sensor;

determining a roll acceleration of the vehicle from the detected acceleration and the known position of the sensor;

-5-

integrating the roll acceleration to determine a roll rate and a roll angle of the vehicle;

generating a control signal [[is]] based on the roll angle, the roll rate and the roll acceleration; and

reducing the roll moment of the vehicle based on the control signal.

16. (Original):   The method of claim 15, wherein the sensor detects a linear acceleration along a sensor axis parallel to the vertical axis.

17. (Original):   The method of claim 15, further comprising a second acceleration sensor positioned along the lateral axis of the vehicle, the second sensor spaced a second distance from the center of gravity.

18. (Currently Amended):   The method of claim 17, wherein the [[first]] <u>sensor</u> and second sensor[[s]] are spaced on opposite sides of the center of gravity.

19. (Original):   The method of claim 15, further comprising the step of filtering out any portion of the detected acceleration that is not representative of the vehicle rotating about its longitudinal axis.

20. (Currently Amended):   The method of claim 19, wherein the filtering step includes providing a model of the vehicle dynamics and [[the]] <u>a</u> model of the sensor[[s]].

-6-

21. (Original):   The method of claim 15, wherein the step of reducing the roll moment includes activating an actuator, the actuator being one or more of a brake control system, an engine control unit and an active steering system.

22.   (Currently Amended):   A system for protecting against rollover in a vehicle comprising:

an array of linear acceleration sensors positioned at predetermined locations relative to the center of gravity of the vehicle, each sensor detecting a linear acceleration along its sensor axis;

a control module having a signal adjuster, an estimator, a signal generator, a model of the vehicle dynamics and a model of the array of sensors;

the signal adjuster receiving the detected accelerations and transforming the accelerations from a sensor coordinate system to a body coordinate system;

the estimator receiving the transformed accelerations and estimating a roll angle based on the transformed accelerations, [[a]] the model of the vehicle dynamics and [[a]] the model of the array of sensors;

the signal generator generating a control signal when the roll angle indicates a tendency of the vehicle to rollover; and

an actuator receiving the control signal and reducing the roll moment of the vehicle based thereon.

23. (Currently Amended):   The system of claim 22, wherein the estimator further estimates a roll rate of the vehicle based on the transformed accelerations, the model of the vehicle dynamics, and the model of the array of sensors.

-7-

24.   (Original):   The system of claim 23, wherein the signal generator generates a control signal based on both the roll angle and the roll rate.

25.   (Original):   The system of claim 22, wherein the estimator further estimates a roll acceleration of the vehicle based on the transformed accelerations, the model of the vehicle dynamics and the model of the sensors.

26.   (Currently Amended):   The system of claim 25, wherein the signal generator generates a control signal based on the roll angle, the roll rate and the roll acceleration.

27.   (Original):   The system of claim 22, wherein the estimator estimates a state vector representing the dynamic condition of the vehicle based on the transformed accelerations, the model of the vehicle dynamics and the model of the sensors.

28.   (Original):   The system of claim 27, wherein the state vector includes a roll angle, a roll rate, a yaw rate and a lateral velocity of the vehicle.

29.   (Original):   The system of claim 22, wherein each acceleration sensor detects a linear acceleration along a sensor axis positioned relative to the vehicle's coordinate system, the coordinate system including a longitudinal axis, a lateral axis and a vertical axis of the vehicle.

-8-

30. (Original):   The system of claim 29, wherein the sensor axis of at least one acceleration sensor is not parallel with any of the longitudinal, lateral and vertical axes.

31. (Original):   The system of claim 29, wherein the location of at least one acceleration sensor is not aligned with any of the longitudinal, lateral and vertical axes.

32. (Original):   The system of claim 22, wherein the actuator is one of a brake control system, an engine control unit and an active steering system.

-9-